

WEST Search History

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DATE: Saturday, June 26, 2004

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<input type="checkbox"/>	L9	L8 and reduc\$3 near3 emission\$1	43
<input type="checkbox"/>	L8	L7 and furnace	115
<input type="checkbox"/>	L7	L6 and hydrogen near1 rich	224
<input type="checkbox"/>	L6	naphtha near3 reform\$3 near4 hydrogen	533
<input type="checkbox"/>	L5	L4 and reduc\$3 near4 carbon dioxide near3 emission\$1	3
<input type="checkbox"/>	L4	L3 and naphtha with hydrogen	224
<input type="checkbox"/>	L3	L2 and carbon dioxide	729
<input type="checkbox"/>	L2	L1 and naphtha	994
<input type="checkbox"/>	L1	(methane or natural gas) and partial oxidation	4591

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Search Results - Record(s) 1 through 5 of 5 returned.

☐ 1. Document ID: US 20030236312 A1

Using default format because multiple data bases are involved.

L15: Entry 1 of 5

File: PGPB

Dec 25, 2003

PGPUB-DOCUMENT-NUMBER: 20030236312

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030236312 A1

TITLE: Process for conversion of LPG and CH4 to syngas and higher valued products

PUBLICATION-DATE: December 25, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
O'Rear, Dennis J.	Petaluma	CA	US	

US-CL-CURRENT: 518/728

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw. De
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☐ 2. Document ID: US 20030191199 A1

L15: Entry 2 of 5

File: PGPB

Oct 9, 2003

PGPUB-DOCUMENT-NUMBER: 20030191199

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030191199 A1

TITLE: REDUCTION OF CARBON DIOXIDE EMISSIONS FROM FISCHER-TROPSCH GTL FACILITY BY AROMATICS PRODUCTION

PUBLICATION-DATE: October 9, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
O'Rear, Dennis J.	Petaluma	CA	US	

APPL-NO: 10/ 118053 [PALM]

DATE FILED: April 9, 2002

INT-CL: [07] C07 C 27/06

US-CL-PUBLISHED: 518/705

US-CL-CURRENT: 518/705

REPRESENTATIVE-FIGURES: 1

ABSTRACT:

Provided is a process for reducing CO.sub.2 emissions generated by a Fischer-Tropsch GTL facility. The process includes introducing a synthesis gas into a Fischer-Tropsch reactor and performing a Fischer-Tropsch process to produce a Fischer-Tropsch product and CO.sub.2. At least a portion of the CO.sub.2 from the Fischer-Tropsch reactor is fed into at least one of a feed stream being fed to a synthesis gas formation reactor, producing the synthesis gas, or the synthesis gas being fed into the Fischer-Tropsch reactor. In addition, naphtha is obtained from the Fischer-Tropsch product and is fed into a naphtha reformer. Naphtha reforming is conducted, generating hydrogen by-product and C.sub.6-C.sub.10 product. At least a portion of the hydrogen by-product, generated during naphtha reforming, is fed into the feed stream, converting at least a portion of the CO.sub.2 in the feed stream into additional CO. Finally, the additional CO is converted into hydrocarbons in the Fischer-Tropsch reactor.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 3. Document ID: US 20020120017 A1

L15: Entry 3 of 5

File: PGPB

Aug 29, 2002

PGPUB-DOCUMENT-NUMBER: 20020120017

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020120017 A1

TITLE: Processes for the production of hydrocarbons, power and carbon dioxide from carbon-containing materials

PUBLICATION-DATE: August 29, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Bohn, Mark S.	Golden	CO	US	
Benham, Charles B.	Littleton	CO	US	

APPL-NO: 09/ 963253 [PALM]

DATE FILED: September 25, 2001

RELATED-US-APPL-DATA:

Application 09/963253 is a division-of US application 09/376709, filed August 17, 1999, US Patent No. 6306917

Application 09/376709 is a continuation-in-part-of US application 09/212374, filed December 16, 1998, ABANDONED

INT-CL: [07] C07 C 27/06

US-CL-PUBLISHED: 518/703

US-CL-CURRENT: 518/703

REPRESENTATIVE-FIGURES: 1

ABSTRACT:

Apparatus and processes for producing power, liquid hydrocarbons and carbon dioxide from heavy feedstocks, using a partial oxidation reactor to produce a synthesis gas, a Fischer-Tropsch reactor to convert the synthesis gas to hydrocarbon products and tail gases containing hydrogen and carbon dioxide, and a combined cycle plant to produce power from steam generated by recovering heat from the reactors and from combustible tail gases. By varying operating conditions and utilizing hydrogen for recycle to the Fischer-Tropsch reactor and/or hydrocracking wax products to produce lighter hydrocarbons, the process can selectively maximize the production of power, hydrocarbons or carbon dioxide. In preferred embodiments, the Fischer-Tropsch reactor can be a slurry reactor and can employ an iron-based catalyst.

CROSS REFERENCED PATENTS

[0001] This application is a divisional application of U.S. application Ser. No. 09/376,709 filed Aug. 17, 1999 and issued as U.S. Pat. No. ----- on ----- which is a continuation-in-part of U.S. application Ser. No. 09/212,374 filed Dec. 16, 1998.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 4. Document ID: US 6693138 B2

L15: Entry 4 of 5

File: USPT

Feb 17, 2004

US-PAT-NO: 6693138

DOCUMENT-IDENTIFIER: US 6693138 B2

TITLE: Reduction of carbon dioxide emissions from Fischer-Tropsch GTL facility by aromatics production

DATE-ISSUED: February 17, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
O'Rear; Dennis J.	Petaluma	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Chevron U.S.A. Inc.	San Ramon	CA			02

APPL-NO: 10/ 118053 [PALM]

DATE FILED: April 9, 2002

INT-CL: [07] C07 C 27/00, C10 G 35/00

US-CL-ISSUED: 518/700; 208/133, 208/141

US-CL-CURRENT: 518/700; 208/133, 208/141

FIELD-OF-SEARCH: 518/700, 208/133, 208/141

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>5620670</u>	April 1997	Benham et al.	
<u>6043288</u>	March 2000	DeGeorge et al.	
<u>6103773</u>	August 2000	Wittenbrink et al.	

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
<u>1006745</u>	October 1965	GB	
<u>01/72674</u>	October 2001	WO	

OTHER PUBLICATIONS

U.S. Patent Application No. 10/118,029, Dennis J. O'Rear, Reducing CO₂ levels in CO₂-rich Natural Gases Converted into Liquid Fuels, Filed Apr. 9, 2002, attorney docket No. 005950-710.

United Kingdom Search Report dated Aug. 26, 2003.

ART-UNIT: 1621

PRIMARY-EXAMINER: Parsa; J.

ATTY-AGENT-FIRM: Burns, Doane, Swecker & Mathis, L.L.P.

ABSTRACT:

Provided is a process for reducing CO₂ emissions generated by a Fischer-Tropsch GTL facility. The process includes introducing a synthesis gas into a Fischer-Tropsch reactor and performing a Fischer-Tropsch process to produce a Fischer-Tropsch product and CO₂. At least a portion of the CO₂ from the Fischer-Tropsch reactor is fed into at least one of a feed stream being fed to a synthesis gas formation reactor, producing the synthesis gas, or the synthesis gas being fed into the Fischer-Tropsch reactor. In addition, naphtha is obtained from the Fischer-Tropsch product and is fed into a naphtha reformer. Naphtha reforming is conducted, generating hydrogen by-product and C₆-C₁₀ product. At least a portion of the hydrogen by-product, generated during naphtha reforming, is fed into the feed stream, converting at least a portion of the CO₂ in the feed stream into additional CO. Finally, the additional CO is converted into hydrocarbons in the Fischer-Tropsch reactor.

17 Claims, 2 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw De
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☐ 5. Document ID: US 6306917 B1

L15: Entry 5 of 5

File: USPT

Oct 23, 2001

US-PAT-NO: 6306917

DOCUMENT-IDENTIFIER: US 6306917 B1

TITLE: Processes for the production of hydrocarbons, power and carbon dioxide from carbon-containing materials

DATE-ISSUED: October 23, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bohn; Mark S.	Golden	CO		
Benham; Charles S.	Littleton	CO		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Rentech, Inc.	Denver	CO			02

APPL-NO: 09/ 376709 [PALM]

DATE FILED: August 17, 1999

PARENT-CASE:

CROSS REFERENCED PATENTS This application is a continuation-in-part of. U.S. application Ser. No. 09/212,374 filed Dec. 16, 1998 now abandoned.

INT-CL: [07] C07 C 27/00

US-CL-ISSUED: 518/700; 518/702, 518/703, 518/715, 518/721

US-CL-CURRENT: 518/700; 518/702, 518/703, 518/715, 518/721

FIELD-OF-SEARCH: 518/703, 518/702, 518/700, 518/721, 518/715

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>3617498</u>	November 1971	Kittrell	
<u>3972958</u>	August 1976	Garwood et al.	
<u>3986349</u>	October 1976	Egan	
<u>4059648</u>	November 1977	Derr et al.	
<u>4092825</u>	June 1978	Egan	
<u>4197184</u>	April 1980	Munro et al.	
<u>4256654</u>	March 1981	Schlenger et al.	
<u>4404088</u>	September 1983	Bachtel et al.	
<u>4433065</u>	February 1984	Van Der Burgt et al.	518/703
<u>4496371</u>	January 1985	Urban et al.	

<u>4501655</u>	February 1985	Hilfman et al.	
<u>4549396</u>	October 1985	Garwood et al.	
<u>4579985</u>	April 1986	Minderhoud et al.	
<u>4595702</u>	June 1986	Chu et al.	
<u>4605639</u>	August 1986	Dyer et al.	
<u>4617288</u>	October 1986	Bell et al.	
<u>4902303</u>	February 1990	Den Bleyker	
<u>4957715</u>	September 1990	Grover et al.	
<u>4992081</u>	February 1991	Den Bleyker	
<u>4994428</u>	February 1991	Bell et al.	
<u>5023276</u>	June 1991	Yarrington et al.	
<u>5026472</u>	June 1991	Hoehn et al.	
<u>5324335</u>	June 1994	Benham et al.	
<u>5324336</u>	June 1994	Child	
<u>5403568</u>	April 1995	Stowe, Jr.	
<u>5424051</u>	June 1995	Nagji et al.	
<u>5500449</u>	March 1996	Benham et al.	
<u>5504118</u>	April 1996	Benham et al.	
<u>5506272</u>	April 1996	Benham et al.	
<u>5543437</u>	August 1996	Benham et al.	
<u>5545238</u>	August 1996	Brooker et al.	
<u>5620670</u>	April 1997	Benham et al.	
<u>5621155</u>	April 1997	Benham et al.	
<u>5645613</u>	July 1997	Benham et al.	
<u>5666800</u>	September 1997	Sorensen et al.	60/39.02
<u>5763716</u>	June 1998	Benham et al.	

OTHER PUBLICATIONS

Author: Marcel Dekker, Inc.; Title: The Fischer-Tropsch Synthesis in the Liquid Phase; Date: 1980; pp. 225-275.

Author: Chemical Engineering; Title: Technology to Cool Down Global Warming; Date: 1999; pp. 37,39,41.

Author: Alberto Rivalts; Title: Orimulsion. A new fuel for power generation and future feedstock use; Date: 1996; pp. 342-344.

Author: Charles B. Benham and Mark S. Bohn; Title: Maximization of Diesel Fuel Production from an Iron-Base Fischer-Tropsch Catalyst; Date: Dec. 1998; pp. 2-5.

Author: A.R. Jones; Title: The commercial combustion of Orimulsion; Date: 1997; pp. 318-339.

Author: Mark S. Bohn and Charles B. Benham; Title: A Comparative Study of Alternate Flowsheets Using Orimulsion as Feedstock; Date: Jan. 1999; pp. 1-10.

Author: David Gray and Glen Tomlinson; Title: A Novel Configuration for Coproducing Fischer-Tropsch Fuels and Electric Power from Coal and Natural Gas; Date: Sep. 1997; pp. 1-6.

Author: Dr. Benham and Dennis Yakobson; Title: Optimization of Conversion of Low Hydrogen Containing Feedstocks ? Using Rentech's Gas-To-Liquids (GTL) Technology; Date: Jul. 1998; pp. 2-19.

Author: Schlesinger, Crowell, Leva, Storch; Title: Fischer-Tropsch Synthesis on Slurry Phase; Date: Jun. 1951; pp. 1474-1479.

Author: Arthur W. Tower III; Title: Gas-to-Liquids, Solids-to-Liquids, Liquids-to-Liquids; Date: Dec. 18, 1998; Pages: whole book.

ART-UNIT: 161

PRIMARY-EXAMINER: Kumar; Shailendra

ASSISTANT-EXAMINER: Parsa; J.

ATTY-AGENT-FIRM: Martin; Rick Patent Law Offices of Rick Martin P.C.

ABSTRACT:

Apparatus and processes for producing power, liquid hydrocarbons and carbon dioxide from heavy feedstocks, using a partial oxidation reactor to produce a synthesis gas, a Fischer-Tropsch reactor to convert the synthesis gas to hydrocarbon products and tail gases containing hydrogen and carbon dioxide, and a combined cycle plant to produce power from steam generated by recovering heat from the reactors and from combustible tail gases. By varying operating conditions and utilizing hydrogen for recycle to the Fischer-Tropsch reactor and/or hydrocracking wax products to produce lighter hydrocarbons, the process can selectively maximize the production of power, hydrocarbons or carbon dioxide. In preferred embodiments, the Fischer-Tropsch reactor can be a slurry reactor and can employ an iron-based catalyst.

13 Claims, 5 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw. De
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Term	Documents
NAPHTHA	46317
NAPHTHAS	9911
HYDROGEN	980164
HYDROGENS	21638
FUEL	773287
FUELS	91272
(14 AND ((NAPHTHA WITH HYDROGEN) SAME FUEL)).PGPB,USPT,USOC,EPAB,JPAB,DWPI.	5
(L14 AND NAPHTHA WITH HYDROGEN SAME FUEL).PGPB,USPT,USOC,EPAB,JPAB,DWPI.	5

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FILE COVERS 1907 - 26 Jun 2004 VOL 141 ISS 1
FILE LAST UPDATED: 25 Jun 2004 (20040625/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> methane and partial oxid?

METHANE IS NOT A RECOGNIZED COMMAND

The previous command name entered was not recognized by the system.

For a list of commands available to you in the current file, enter "HELP COMMANDS" at an arrow prompt (=>).

=> s (methane or natural gas or hydrocarbon) (l) partial oxid?

153496 METHANE

3204 METHANES

154844 METHANE

(METHANE OR METHANES)

616643 NATURAL

31 NATURALS

616661 NATURAL

(NATURAL OR NATURALS)

1364007 GAS

470209 GASES

1532769 GAS

(GAS OR GASES)

64195 NATURAL GAS

(NATURAL(W)GAS)

307933 HYDROCARBON

307105 HYDROCARBONS

473314 HYDROCARBON

(HYDROCARBON OR HYDROCARBONS)

346013 PARTIAL

919 PARTIALS

346574 PARTIAL

(PARTIAL OR PARTIALS)

2615075 OXID?

9536 PARTIAL OXID?

(PARTIAL(W)OXID?)

L1 3750 (METHANE OR NATURAL GAS OR HYDROCARBON) (L) PARTIAL OXID?

=> s l1 and synthesis gas

1126911 SYNTHESIS

3 SYNTHESISES

61904 SYNTHESSES

1162021 SYNTHESIS

(SYNTHESIS OR SYNTHESISES OR SYNTHESSES)

1364007 GAS

470209 GASES

1532769 GAS

(GAS OR GASES)

14530 SYNTHESIS GAS

(SYNTHESIS(W)GAS)

L2 1434 L1 AND SYNTHESIS GAS

```
=> s l2 and reform? (L) naphtha
    41708 REFORM?
    20398 NAPHTHA
    1652 NAPHTHAS
    20755 NAPHTHA
        (NAPHTHA OR NAPHTHAS)
    3884 REFORM? (L) NAPHTHA
L3      13 L2 AND REFORM? (L) NAPHTHA
```

```
=> s l13 and carbon dioxide
L13 NOT FOUND
The L-number entered could not be found. To see the definition
of L-numbers, enter DISPLAY HISTORY at an arrow prompt (=>).
```

```
=> s l3 and carbon dioxide
    1061088 CARBON
    23608 CARBONS
    1069693 CARBON
        (CARBON OR CARBONS)
    412819 DIOXIDE
    6328 DIOXIDES
    414408 DIOXIDE
        (DIOXIDE OR DIOXIDES)
    192624 CARBON DIOXIDE
        (CARBON(W)DIOXIDE)
L4      3 L3 AND CARBON DIOXIDE
```

```
=> d l4 ibib ab 1-3
```

```
L4  ANSWER 1 OF 3  CAPLUS  COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:      2004:203348  CAPLUS
DOCUMENT NUMBER:       140:220494
TITLE:                 Dynamic sulfur tolerant process and system with inline
                        acid gas-selective removal for generating hydrogen for
                        fuel cells
INVENTOR(S):           Randhava, Surjit; Ho, W. S. Winston; Kao, Richard L.;
                        Camara, Elias H.
PATENT ASSIGNEE(S):    H2Fuel, LLC, USA; University of Kentucky Research
                        Foundation
SOURCE:                U.S. Pat. Appl. Publ., 19 pp.
                        CODEN: USXXCO
DOCUMENT TYPE:         Patent
LANGUAGE:              English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:
```

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004047799	A1	20040311	US 2002-236324	20020906

PRIORITY APPLN. INFO.: US 2002-236324 20020906

AB A dynamic sulfur tolerant process with inline acid gas-selective removal for converting sulfur-containing carbonaceous fuels into hydrogen or hydrogen rich gases includes the following steps: vaporizing liquid fuels and water in a vaporizer/preheater by transferring heat from **reformat** gas; feeding fuel, water and oxidant (air or oxygen) over a sulfur tolerant catalyst in an autothermal hydrodesulfurizing **reformer** (AHR) to yield a hydrogen rich **reformat** gas to combine the heat effects of the **partial oxidn.**, steam **reforming** reactions, preheat and heat losses; converting CO and steam in the **reformat** gas to addnl. hydrogen and CO₂ via a water gas shift (WGS) reaction in a WGS reactor; vaporizing and superheating water fed to a WGS boiler coil in a steam generator; removing selectively substantial amts. of acid gas (H₂S and CO₂) in WGS product gas in an acid-gas selective membrane separator (ASMS); further reducing CO and CO₂ concentration

levels in a methanator; and interchanging heat between hydrogen-rich gas and sweep gas in a heat interchanger. The ASMS product gas at 180-230° containing 0.5-2 mol% CO and <100 ppb H₂S is an ideal feed for phosphoric acid fuel cells. The ASMS enables the methanation reaction equilibrium to decrease the CO and CO₂ concns. in the hydrogen-rich gas to appropriate levels suitable for feeding PEM and alkaline fuel cells. The acid gas-selective membrane in the ASMS consists of polyamine and polyimide blends and copolymers which have a high acid gas/H₂ selectivity and a good thermal stability of ≤ 325°C. The membrane can consist of poly (2 or 4-vinylpyridine) and polyimide derived from polyamic acid which is synthesized from oxydianiline and oxydiphthalic anhydride. The fuel can be gasoline, diesel, **naphtha**, **natural gas**, liquefied petroleum gas (LPG), heating oil, kerosene, jet fuel, alkanes, alkenes, aroms., and **hydrocarbon** streams and alcs. selected from the group consisting of methanol, ethanol, butanol, pentanol, or alc.-containing steams. The AHR catalyst contains a Group IV rare earth metal sulfide, or a Group IV rare earth metal sulfate as hydrodesulfurization portion, a Group VIII transition metal and an alloy of a Group VIII transition metal as a dehydrogenation portion, and a ceramic oxide, a doped oxide, such as ZrO₂, CeO₂, Bi₂O₃, BiVO₄, LaGdO₃, Gd doped ceria, as an oxidation portion.

L4 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:368370 CAPLUS

DOCUMENT NUMBER: 136:388285

TITLE: Method and catalyst for hydrocarbon reforming to produce hydrogen and syngas

INVENTOR(S): Fukunaga, Tetsuya

PATENT ASSIGNEE(S): Idemitsu Kosan Co., Ltd., Japan

SOURCE: PCT Int. Appl., 27 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002038268	A1	20020516	WO 2001-JP9660	20011105
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2002011004	A5	20020521	AU 2002-11004	20011105
EP 1338335	A1	20030827	EP 2001-979007	20011105
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 2004014600	A1	20040122	US 2003-415558	20030501
PRIORITY APPLN. INFO.: JP 2000-339897 A 20001108				
WO 2001-JP9660 W 20011105				

AB A catalyst suitable for use in various reforming reactions of **hydrocarbons**; and a process for producing H₂ or **synthesis gas** which comprises using this catalyst to reform light **hydrocarbons**, are described. The catalyst comprises an alumina support containing Ce oxide and supported thereon (1) ≥1 Pt-group metals such as Ru, Pt, Rh, Pd, and Ir, (2) a Co and/or Ni ingredient, and (3) optionally an alkaline earth metal ingredient. The catalyst is useful for steam reforming, thermal self-reforming, **partial oxidative** reforming, or **carbon dioxide**

reforming of a **hydrocarbon** to produce H2 or **synthesis gas**.

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1993:606878 CAPLUS
DOCUMENT NUMBER: 119:206878
TITLE: Process for the production of **synthesis gas**
INVENTOR(S): Hiles, Andrew George
PATENT ASSIGNEE(S): Davy McKee (London) Ltd., UK
SOURCE: PCT Int. Appl., 34 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9315999	A1	19930819	WO 1993-GB329	19930217
W: AT, AU, BB, BG, BR, CA, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, LK, LU, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, US				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, SN, TD, TG				
AU 9335083	A1	19930903	AU 1993-35083	19930217
PRIORITY APPLN. INFO.:			GB 1992-3375	19920218
			WO 1993-GB329	19930217

AB **Synthesis gas** is prepared from a **hydrocarbon** feedstock, e.g., **natural gas**, liquefied petroleum gas, **naphtha**, or a gas oil, by subjecting a part thereof to steam **reforming** and another part to **partial oxidn.** The hot gas stream from the steam **reformer** at 650-950° and 30-60 bar contains typically unconverted **hydrocarbon** and is mixed with the hot gas from the **partial oxidn.** unit which is at the same pressure as the hot gas from the steam **reformer** and at a temperature of 1200-1500°. The mixed stream at 1100-1200° can be passed through a secondary **reforming** zone to reduce CH4 content in the mixed stream to 2-5% or more on a dry gas basis. The exit gas from the secondary **reformer** can then be cooled and compressed for use, in MeOH synthesis. By adjusting the ratio of amts. of **hydrocarbon** feedstock fed to the steam **reformer** and to the **partial oxidn.** unit, the steam:C ratio in the steam **reformer**, and the O:C ratio for the **partial oxidn.** unit, the stoichiometry of the resulting **synthesis gas** can be adjusted to the desired value.

=> s reduc? (2a) carbon dioxide emission?

1836537 REDUC?
811690 REDN
43888 REDNS
839203 REDN
(REDN OR REDNS)
2299730 REDUC?
(REDUC? OR REDN)
1061088 CARBON
23608 CARBONS
1069693 CARBON
(CARBON OR CARBONS)
412819 DIOXIDE
6328 DIOXIDES

414408 DIOXIDE
(DIOXIDE OR DIOXIDES)
470318 EMISSION?
1488 CARBON DIOXIDE EMISSION?
(CARBON(W)DIOXIDE(W)EMISSION?)
L5 316 REDUC? (2A) CARBON DIOXIDE EMISSION?

=> s 15 and gas (1a) liquid
1364007 GAS
470209 GASES
1532769 GAS
(GAS OR GASES)
654512 LIQUID
119450 LIQUIDS
744941 LIQUID
(LIQUID OR LIQUIDS)
900719 LIQ
85888 LIQS
934006 LIQ
(LIQ OR LIQS)
1303653 LIQUID
(LIQUID OR LIQ)
81873 GAS (1A) LIQUID
L6 3 L5 AND GAS (1A) LIQUID

=> s 15 and naphtha (2a) reform?
20398 NAPHTHA
1652 NAPHTHAS
20755 NAPHTHA
(NAPHTHA OR NAPHTHAS)
41708 REFORM?
3143 NAPHTHA (2A) REFORM?
L7 1 L5 AND NAPHTHA (2A) REFORM?

=> s 16 or 17
L8 3 L6 OR L7

=> d 18 ibib ab 1-3

L8 ANSWER 1 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:796335 CAPLUS

DOCUMENT NUMBER: 139:293676

TITLE: **Reduction of carbon
dioxide emissions** from a
Fischer-Tropsch **gas-to-liquid**
facility by aromatics production

INVENTOR(S): O'Rear, Dennis J.

PATENT ASSIGNEE(S): Chevron U.S.A., Inc., USA

SOURCE: U.S. Pat. Appl. Publ., 9 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003191199	A1	20031009	US 2002-118053	20020409
US 6693138	B2	20040217		
WO 2003087264	A2	20031023	WO 2003-US8759	20030320
WO 2003087264	A3	20031224		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,

LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,
PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ,
UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU,
TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG,
CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC,
NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG

GB 2388117 A1 20031105 GB 2003-7419 20030331
NL 1023136 A1 20031013 NL 2003-1023136 20030409

PRIORITY APPLN. INFO.: US 2002-118053 A 20020409

AB The process includes introducing a synthesis gas into a Fischer-Tropsch reactor and performing a Fischer-Tropsch process to produce a Fischer-Tropsch product and CO₂. A portion of the CO₂ from the Fischer-Tropsch reactor is fed into at least one of a feed stream being fed to a synthesis gas formation reactor, producing the synthesis gas, or the synthesis gas being fed into the Fischer-Tropsch reactor. Naphtha is obtained from the Fischer-Tropsch product and is fed into a **naphtha reformer** generating a hydrogen byproduct and a C₆-10 product. A portion of the hydrogen byproduct, generated during **naphtha reforming**, is fed into the feed stream, converting a portion of the CO₂ in the feed stream into addnl. CO and the addnl. CO is converted into hydrocarbons in the Fischer-Tropsch reactor.

L8 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:385538 CAPLUS

DOCUMENT NUMBER: 137:65455

TITLE: CO₂ mitigation and fuel production

AUTHOR(S): Steinberg, M.

CORPORATE SOURCE: Department of Applied Science, Brookhaven National Laboratory, Upton, NY, 11973, USA

SOURCE: ACS Symposium Series (2002), 809(CO₂ Conversion and Utilization), 31-38

CODEN: ACSMC8; ISSN: 0097-6156

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB CO₂ mitigation technologies deals with how to utilize fossil fuels, coal, oil and gas with reduced CO₂ emissions. Most development work to date has emphasized improving efficiency in generation and utilization of energy and in removal and recovery of CO₂ from central power stations followed by disposal in underground wells or in the ocean. The latter suffers from economic penalties and potential adverse environmental effects. CO₂ utilization for the chems. industry is problematic because of the capacity mismatch between the gross CO₂ emission and the relatively smaller chemical products market. However, utilization of CO₂ for conversion to alternative fuels for stationary and automotive power has potential of matching capacity between emissions and utilization. Although hydrogen-rich gaseous fuels such as methane and hydrogen can be used as alternative automotive liquid fuels which includes methanol and other higher oxygenates appear safer and fit in with the current liquid fuel infrastructure. The key for **gas** to **liq.** conversion utilizing CO₂ is the production of hydrogen for conversion with CO₂. The Carnol process, catalytically reacts CO₂ from coal fired plants with hydrogen from the thermal decomposition of methane while sequestering the elemental carbon, to produce methanol and higher oxygenated fuels. CO₂ emission redns. approaching 80% using fuel cell engines can be achieved compared to the conventional system of coal-fired power generating plants and gasoline-driven IC automotive engines.

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1993:606860 CAPLUS

DOCUMENT NUMBER: 119:206860
TITLE: Evaluation of liquid fuel production technology from
natural gas and coal from the viewpoint of the
**reduction of carbon dioxide
emission**

AUTHOR(S): Inaba, Atsushi; Saito, Ikuo
CORPORATE SOURCE: Natl. Inst. Resour. Environ., Tsukuba, Japan
SOURCE: Nippon Enerugi Gakkaishi (1993), 72(6), 457-66
CODEN: NENGEM; ISSN: 0916-8753

DOCUMENT TYPE: Journal
LANGUAGE: Japanese

AB Technologies for production of electricity and liquid fuel from natural gas and/or coal were evaluated from the viewpoint of reduction of CO2 emissions in the long run, when petroleum would not be produced. If natural gas supply are not sufficient to satisfy demands of both electricity and liquid fuel production and if those technologies are not improved in their thermal efficiency from the present practical levels, natural gas used for the power generation should be replaced with coal because CO2 emissions from such systems would be smaller than by systems in which coal is used for liquid fuel production. However, if direct coal liquefaction technol. is improved near the level of theor. reaction, the utilization of coal for liquid fuel production instead of power generation can reduce CO2 emissions.

In

this case, if hydrogen produced from natural gas is used for direct coal liquefaction, and CO2 emissions can be reduced much more. In integrated energy systems, in which excess hydrogen from liquid fuel production from natural gas is used for the indirect liquefaction of coal, is useful for the reduction of CO2 emissions when the reaction heat of steam reforming of natural gas is supplied from the outside such as high-temperature gas-cooled nuclear reactor.